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09/882,787	06/14/2001	Wei Qi	MS1-717US	9983
22801	7590	06/04/2004	EXAMINER	
LEE & HAYES PLLC 421 W RIVERSIDE AVENUE SUITE 500 SPOKANE, WA 99201			MARIAM, DANIEL G	
			ART UNIT	PAPER NUMBER
			2621	6

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/882,787

Applicant(s)

QI ET AL.

Examiner

DANIEL G MARIAM

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) <sup>1-36</sup>~~36~~ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 8-14, 16-33, 35 and 36 is/are rejected.
- 7) ☒ Claim(s) 3-7, 15 and 34 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3, 4, and 5</u> . | 6) <input type="checkbox"/> Other: ____.  |

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## DETAILED ACTION

### *Claim Objections*

1. Claim 36 is objected to because of the following informalities: in claim 36, the limitation “ration” recited in line 2 appears to be misspelled. Appropriate correction is required.

### *Claim Rejections - 35 USC § 101*

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 11 and 29 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 11 recites the limitation “a storage medium comprising a plurality of executable instructions . . .” and claim 29 recites “a storage medium comprising . . .” which are non-statutory. A program is functional descriptive material, and is only statutory when embodied in a computer readable medium. Applicant may overcome this rejection by rewriting the limitation “a storage medium” as “A computer medium or a computer-readable medium storing or comprising . . . . .” (See MPEP 2106).

Since claims 30-32 directly or indirectly depend on claim 29, they are also rejected under 35 U.S.C. 101, for the same reason set forth above for claim 29.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claims 12 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Golin (5,990,980).

With regard to claim 12, a media analysis agent comprising: a shot boundary detector to statistically analyze one or more attributes, i.e., histogram/s, associated with content in video frames to detect abrupt and gradual transitions in the video content indicative of a shot boundary (See for example, Figs. 4-6; and col. 4, line 58 through col. 5, line 19); and a flashlight detector (which corresponds to item 116, in Fig. 1), responsive to the shot boundary detector, to distinguish abrupt transition in the video content caused by flashlight, i.e., camera flashes, events from those caused by actual shot boundaries, to reduce false-positive identification of flashlight events as shot boundaries (See items 25-26, in Fig. 2; and col. 6, lines 50-61).

With regard to claim 29, a storage medium comprising a plurality of executable instructions which, when executed, implement a media analysis agent to detect shot boundaries resulting from an abrupt or gradual transition in content between frames, and further to distinguish abrupt transitions caused by shot cuts from those caused by flashlight events (See for example, col. 5, lines 30-33; col. 6, lines 38-61; and Fig. 2).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1-2, 8-11, 13, 21-28, 30-33, and 35-36 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Golin (5,990,980) in view of Chen, et al. (5,751,378).

With regard to claim 1, a method comprising: identifying an abrupt transition in (average) light intensity between two frames, and determining whether the abrupt transition was caused by a shot boundary, i.e., the start and end frames of the transition, cut, scene change, between the two frames or by a flashlight event (See for example, col. 5, line 30 through col. 6, line 67). While abrupt transition or change generally occurs from quick changes in scene illumination, i.e., average intensity, Golin does not explicitly mention identifying the abrupt transition in average light intensity. However, Chen, et al (col. 6, lines 33-58) teaches this feature. Golin and Chen, et al. are combinable because they are from the same field of endeavor, i.e., scene change detection (See for example, col. 1, lines 5-10). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Chen, et al. with Golin. The motivation for doing so is to provide an average lighting intensity that can be used to detect a scene change, and to do so would at least improve the scene change detection and would also minimize the processing time. Therefore, it would have been obvious to combine Chen, et al. with Golin to obtain the invention as specified in claim 1.

With regard to claim 2, a method according to claim 1, wherein identifying an abrupt transition comprises: calculating a difference in light intensity histograms between the current frame and a preceding frame (See for example, col. 4, line 58 through col. 5, line 18 of Golin); and comparing the histogram difference to a (dynamically) determined threshold (i.e., specified threshold), wherein an abrupt transition is indicated if the histogram difference exceeds the threshold (See for example, col. 5, lines 21-33; and col. 7, lines 3-41 of Golin). While Golin

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uses a specified or predetermined threshold/s, Golin does not elaborate the threshold/s as being dynamic or adaptive. However, Chen, et al. (col. 8, lines 3-25) teaches this feature. Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the teaching as taught by Chen, et al into the system of Golin, if for no other reason than to improve the scene change detection by using an adaptive threshold.

With regard to claim 8, a method according to claim 1, wherein determining a cause of the abrupt transition comprises: calculating a difference in average minimal intensity values between a window of frames preceding the current frame and a window of frames subsequent to the current frame, generating a ratio of the average intensity change of the current frame to the calculated difference in average minimal intensity values; and concluding that the abrupt transition is caused by a flashlight event if the ratio does not exceed a threshold (See for example, col. 6, lines 50-61; and Fig. 2 of Golin; and Fig. 2 of Chen, et al. where window is referred as "block" and difference is defined as "subtractor").

With regard to claim 9, a method according to claim 8, wherein calculating a difference in average minimal intensity values comprises: identifying a window, i.e., block, of frames on either side of the current frame, generating an average minimal intensity value for each window from a first and second minimal abrupt transition respectively, and calculating the difference between the generated average minimal intensity values (See for example, Fig. 2 of Golin).

With regard to claim 10, a method according to claim 8, wherein the threshold is equal to one (1), wherein a ratio that deviates from one indicates that the abrupt transition is due to a shot cut, while a ratio close to one indicates that the abrupt transition is due to a flashlight event (this

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feature reads on item 116, in Fig. 1, col. 6, lines 38-61; and Fig. 2 of Golin; and col. 7, lines 4-5; col. 8, lines 3-25; and Fig. 2 of Chen, et al.).

With regard to claim 11, a storage medium comprising a plurality of executable instructions which (See Fig. 2 of Golin), when executed, implement a method according to claim 1 (Arguments presented above for claim 1 are not repeated herein, but are incorporated by reference).

With regard to claim 13, Golin discloses all of the claimed subject matter as already discussed above for claim 12, and the arguments are incorporated herein by reference. While Golin uses specified or predetermined threshold/s for use in shot boundary identification based, at least in part, on one or more attributes of video content (See for example, col. 5, lines 19-33; and Fig. 2, items 16-25). Golin, however, does not explicitly call for an adaptive threshold selection module, responsive to the shot boundary detector, to dynamically set one or more thresholds for use in shot boundary identification. However, Chen, et al. (col. 8, lines 3-25) teaches this feature. Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the teaching as taught by Chen, et al into the system of Golin, if for no other reason than to improve the scene change detection by using an adaptive threshold.

With regard to claim 21, a media analysis agent according to claim 13, wherein the shot boundary detector calculates a difference in light intensity histograms between a current frame and a preceding frame, and compares the histogram difference to a dynamically determined threshold, wherein an abrupt transition is identified by a histogram difference that exceeds the threshold (col. 5, lines 24-33; and item 20, in Fig. 2 of Golin).

With regard to claim 22, a media analysis agent according to claim 21, wherein shot boundary detector invokes an instance of flashlight detector to determine whether the abrupt transition is the result of a flashlight event (See item 116, in Fig. 1; and col. 6, lines 50-61 of Golin).

With regard to claim 23, a media analysis agent according to claim 12, wherein flashlight detector calculates a difference, i.e., subtractor, in average minimal intensity values between a first sliding window, i.e., block, preceding the current frame, and a second sliding window subsequent to the current frame (See Fig. 2 of Chen, et al).

With regard to claim 24, a media analysis agent according to claim 23, wherein flashlight detector calculates the average intensity change of the current frame, and generates a ratio of the difference in average minimal intensity values to the average intensity change of the current frame (See for example, col. 6, lines 50-61; and Fig. 2 of Golin; and Fig. 2 of Chen, et al).

With regard to claim 25, a media analysis agent according to claim 24, wherein flashlight detector determines that the abrupt change was due to a flashlight event if the ratio does not exceed a threshold value (See for example, col. 6, lines 50-61; and items 20-25, in Fig. 2 of Golin).

With regard to claim 26, a media analysis agent according to claim 25, wherein the threshold value is one (1) (which reads on col. 7, lines 4-5; and col. 8, lines 3-25 of Chen, et al).

With regard to claim 27, a media analysis agent according to claim 25, wherein the flashlight detector concludes that the abrupt transition was caused by a shot boundary if the ratio exceeds the threshold value (item 20, in Fig.2; and col. 6, lines 50-61 of Golin).



With regard to claim 28, a computing system comprising: a memory, to receive media content; and a media processing system, coupled to the memory device, including a media analysis agent according to claim 12 to segment the received media content into uniquely identifiable shots (col. 11, lines 35-53; col. 5, lines 34-46; and col. 13, lines 32-37).

With regard to claims 30 and 31, claim 8 encompasses the limitation of these claims, and thus these claims are rejected the same as claim 8. Argument similar to that presented above for claim 8 is equally applicable to claims 30 and 31.

Claim 32 is rejected the same as claim 10. Thus, argument similar to that presented above for claim 10 is equally applicable to claim 32.

Claims 35 and 36 are rejected the same as claims 8 and 10 respectively. Thus arguments analogous to those presented above for claims 8 and 10 are respectively applicable to claims 35 and 36.

With regard to claim 33, one or more computer-readable media having stored thereon a computer program that, when executed by one or more processors, causes the one or more processors (See for example Figs. 1 and 2; and col. 11, lines 34-50) to: calculate a difference in light intensity histograms between two frames, compare the histogram difference to a (dynamically) determined threshold (col. 4, line 58 through col. 5, line 18), wherein an abrupt transition is indicated if the histogram difference exceeds the threshold (See for example, col. 5, lines 20-33; and item 20, in Fig. 2); and determine whether the abrupt transition was caused by a shot boundary between the two frames or by a flashlight event (Item 116, in Fig. 1; and col. 6, lines 50-61). While Golin uses specified or predetermined threshold/s for use in shot boundary

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identification based, at least in part, on one or more attributes of video content (See for example, col. 5, lines 19-33; and Fig. 2, items 16-25). Golin, however, does not explicitly call for a dynamically determined threshold. However, Chen, et al. (col. 8, lines 3-25) teaches an adaptive threshold, which is dynamically set threshold. Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the teaching as taught by Chen, et al into the system of Golin, if for no other reason than to improve the scene change detection by using an adaptive threshold.

7. Claims 14 and 16-20 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Golin in view of Chen, et al and further in view of Ratakonda (5,995,095).

With regard to claim 14, Golin (as modified by Chen, et al) discloses all the claimed subject matter as already discussed above in paragraph 6, and incorporated herein by reference. While Golin (as modified by Chen, et al) computes histogram difference and generates a proposed low threshold value ( $T_s$ ), i.e., first threshold, and a proposed high-threshold value ( $T_b$ ), i.e., second threshold, from the histogram difference (See col. 5, lines 3-33; and Fig. 2). Golin (as modified by Chen, et al) does not explicitly call for calculating an average and standard deviation of a histogram difference in a sliding window of frames surrounding the current frame. However, Ratakonda (col. 6, lines 10-44) teaches this feature. Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the teaching a taught by Ratakonda into the system of Golin (as modified by Chen, et al), and to do so would at least improve the accuracy of generating the appropriate adaptive or adjustable, threshold.

With regard to claim 16, a media analysis agent according to claim 14, wherein the adaptive threshold selection module certifies the proposed thresholds if the calculated standard deviation does not reach a standard deviation threshold (See for example, col. 18-38 of Ratakonda).

With regard to claim 17, a media analysis agent according to claim 16, wherein if the adaptive threshold selection module cannot certify the proposed thresholds, prior thresholds are used by shot boundary detector (See for example, col. 18-38 of Ratakonda; and col. 8, lines 3-25 of Chen, et al).

With regard to claim 18, a media analysis agent according to claim 14, wherein the high threshold is used to identify an abrupt transition while the low threshold is used to indicate a potential gradual transition (col. 5, lines 19-33; col. 3, lines and Fig. 2 of Golin).

With regard to claim 19, a media analysis agent according to claim 18, wherein shot boundary detector compares the histogram difference to a low threshold if the difference does not exceed the high threshold, and accumulates the histogram differences of frames wherein the difference exceeds the low threshold (See for example, Figs. 2 and 7 of Golin).

With regard to claim 20, a media analysis agent according to claim 19, wherein shot boundary detector identifies a gradual transition when the accumulated histogram differences exceed the high threshold (See for example, items 20-24, in Fig. 2 of Golin).

***Allowable Subject Matter***

8. Claims 3-7, 15, and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The above-identified prior art do not teach or suggest wherein dynamically determining the threshold comprises: calculating an average and standard deviation value of the histogram difference in a sliding window of frames; generating one or more thresholds as multiples of the calculated average; determining whether the calculated standard deviation falls below a standard deviation threshold before adopting the generated one or more thresholds; and wherein the proposed low threshold is two- to three-times the calculated average histogram difference, while the proposed high threshold is four- to five-times the calculated average histogram difference. It is for this reason that claims 3-7, 15, and 34 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent Numbers: 5642294, 5745190, 5774593, 5801765, 5835163, 5900919, 5920360, 5959697, 6462754, and 5911008; and publications to: Yeo, et al. "Rapid scene analysis on compressed video"; Gu, et al. "Dissolve detection in MPEG compressed video"; Gamaz, et al. "Robust scene-change detection in MPEG compressed domain"; O'Toole "An MPEG-1 shot boundary detector using XIL colour histograms"; Heng, et al. "Post shot boundary detection technique: Flashlight scene determination"; Lelescu, et al. "Real-time scene change detection on

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compressed multimedia bitstream based on statistical sequential analysis"; and Yusoff, et al.  
"Video shot cut detection using adaptive thresholding".

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL G MARIAM whose telephone number is 703-305-4010. The examiner can normally be reached on M-F (7:00-4:30) FIRST FRIDAY OFF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, LEO BOUDREAU can be reached on 703-305-4607. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
**DANIEL MARIAM**  
**PRIMARY EXAMINER**

May 25, 2004